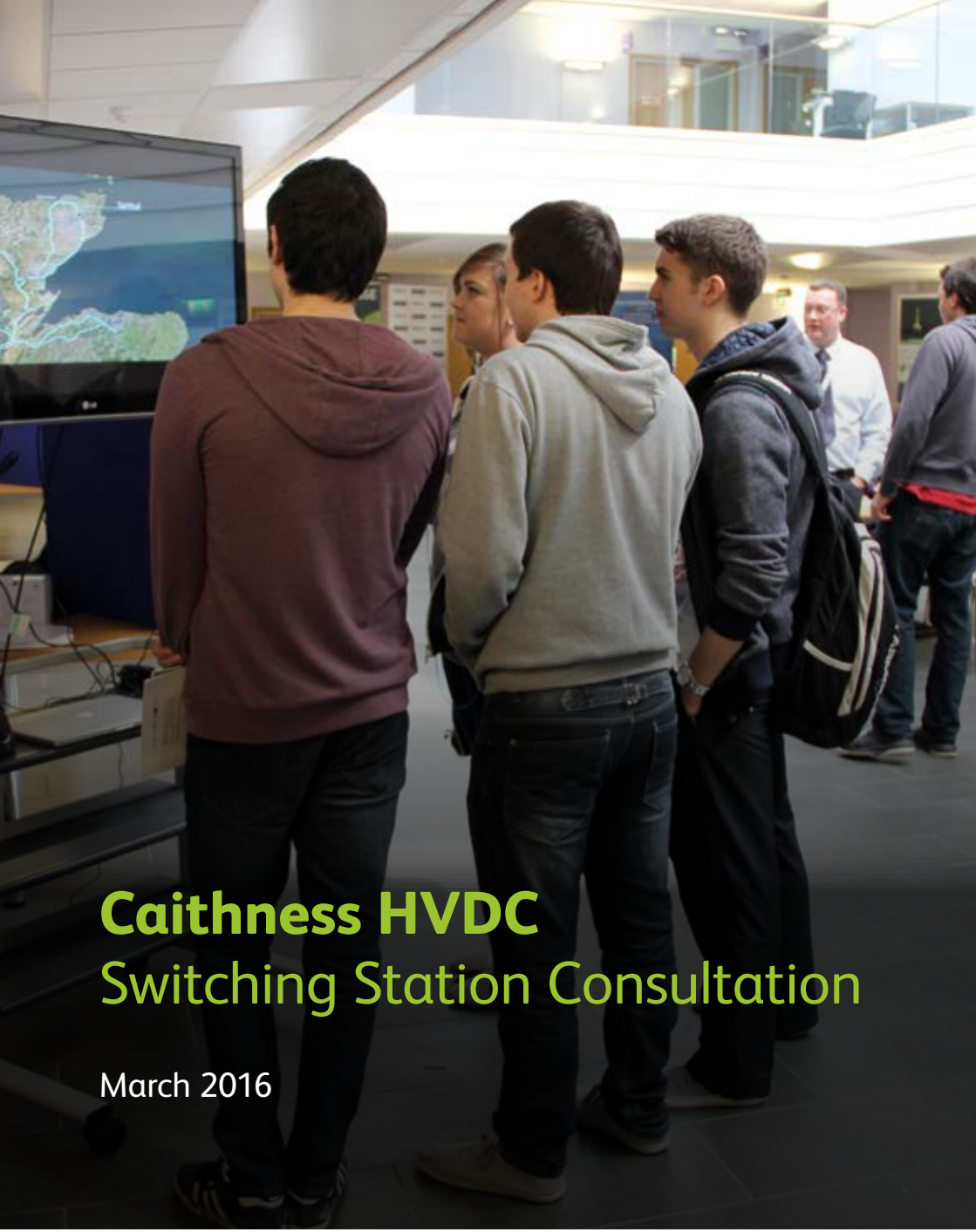


Caithness HVDC
Switching Station Consultation

March 2016

Scottish and Southern Energy
Power Distribution

Who are we?

Building the North's future energy network

The north of Scotland's electricity network is currently seeing the most sustained investment programme since the 1950s, to accommodate new sources of renewable electricity and to deliver an upgraded network to meet your needs for decades to come.

In Caithness, in recent years we have replaced Dounreay substation and upgraded the overhead line between Dounreay and Beauly.

We are currently delivering an innovative £1.12 billion project to connect Caithness and Moray with a high voltage direct current (HVDC) cable.

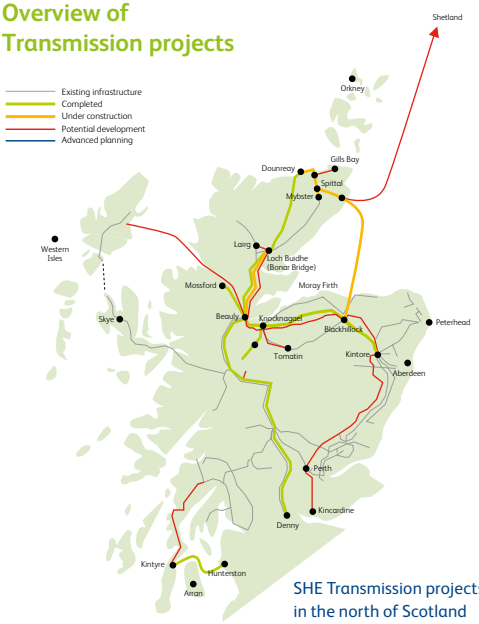
HVDC technology makes it possible to transmit electricity efficiently across the distances involved in crossing the Moray Firth and connecting Shetland to Great Britain.

There are two further projects in development which build upon the strengthened network the Caithness – Moray project provides:

- A new 132 kilovolt connection between Thurso South and a new substation near Gills Bay to connect proposed tidal generators in the Pentland Firth to the transmission network.
- An HVDC cable to connect Shetland to the Great Britain transmission system for the first time, allowing renewable energy to be exported from the islands. This would connect to the Caithness – Moray cable at the proposed Switching Station.

Dounreay Substation

Overview of Transmission projects



SHE Transmission projects in the north of Scotland

About SHE Transmission

Scottish Hydro Electric Transmission plc (SHE Transmission) owns, maintains and invests in the high voltage electricity network – the 'grid' – that serves the north of Scotland.

In total, we maintain about 5,000km of overhead lines and underground cables. Our network crosses some of the UK's most challenging terrain – including some circuits which are over 750 metres above sea level and up to 250km long.

SHE Transmission is the transmission licence holder in the north of Scotland. We have a legal duty to facilitate competition in the generation and supply of electricity. This means we must offer (on a non-discriminatory basis) connections to the grid both for new electricity generators and for new sources of demand.

Ofgem, the energy regulator, closely monitors all our activities, and individually assesses the case for strategic investments, such as the Caithness – Moray and Shetland projects.

Background

Why is the project needed?

SHE Transmission is required to develop proposals to accommodate new sources of electricity generation seeking to connect to the transmission network.

Viking wind farm (Shetland) has contracted with National Grid plc to connect to the transmission network by 2021. As Shetland is not currently connected to the Great Britain grid, a new connection is needed.

We have therefore proposed a High Voltage Direct Current (HVDC) cable, with a capacity of 600 MW, connecting to the HVDC system that is currently being installed between Caithness and Moray.

This will allow the export of energy from Viking wind farm and other potential new generators in the islands with the minimum of new infrastructure. It would also be capable of supplying power to Shetland if required.

To connect with the Caithness – Moray system, a switching station is required.

Cable laying – offshore and onshore

What is HVDC?

In alternating current (AC) circuits, the current continuously changes direction at a frequency of 50 Hertz (cycles per second). By contrast, in direct current (DC) circuits, the current flows in a single direction all the time.

DC electricity is not new, cars and torches both use low voltage DC but household electricity and the current transmission grid use AC, mainly because it is easier to transform from high voltage (for efficient transmission) to low voltage (for use in the house).

Advancing technology has enabled the growing use of HVDC for transmission in recent years. It is highly efficient for carrying large volumes of power across long distances, and it can be easily cabled underground. It is still not common in the UK because of the complexity in converting from DC to AC and because the convertor stations needed to connect individual cables into a network are very complex.

New generation requires increased grid capacity

What is an HVDC Switching Station?

An HVDC Switching Station does simply what the name suggests – it allows the flow of power to be switched between different circuits.

The proposed Switching Station at Noss will connect 3 HVDC cables – one underground from Spittal in Caithness, one mainly subsea from Shetland and one mainly subsea to Moray. It has room for one additional cable to meet future requirements.

The Switching Station does not dictate which way the power flows. This will be controlled by the Network Management Centre in Perth under instruction from National Grid (the transmission system operator across Great Britain). Power could flow in any direction, but in normal circumstances, renewable energy will flow from both Spittal and Shetland to Moray, where it will be converted back to AC for onward transmission via the existing overhead line network.

The development process

The chart below shows the main stages of the development process and the opportunities there will be for local people and others to give feedback as site selection, design and environmental work progresses. All dates are indicative at this early stage.

Spring–Summer 2015

Search to identify multiple potential sites and carry out preliminary assessments

First Pre-Application Consultation
Carry out consultation with the statutory authorities and public on the multiple sites

September 2015

February 2016

Consider the feedback from consultation and identify a preferred site

March 2016

Develop an outline design for the preferred site, including landscaping proposals

Second Pre-Application Consultation
Carry out consultation with the statutory authorities and public on the outline design

April 2016

Submit Proposal of Application Notice to the Highland Council

May 2016

Consider feedback from consultation and continue to develop the design

Carry out detailed environmental surveys and assessments to inform planning application

Final Pre-Application Consultation
Carry out final pre-application consultation with the statutory authorities and public on the detailed design and environmental assessments

Summer 2016

Consider any final feedback on detailed proposals

Autumn 2016

Submit planning application to the Highland Council

October 2016

Submit Need Case and Project Assessment to Ofgem for approval

Statutory Consultation
Highland Council will carry out a statutory consultation following submission during which representations can be made directly to the planning authority

2017

Indicative timescale of 2 years from the start of construction

Determination of planning application

Subject to consents, pre-construction works begin on site

Completion of Switching Station Construction

The search for sites

What has happened so far?

SHE Transmission has been developing options to connect growing volumes of renewable generation in the north of Scotland and the islands for a number of years.

In 2012 we began looking for a site for a switching station in Caithness able to connect up to 10 HVDC circuits, reflecting the scale of proposed marine and offshore generation development at the time. A number of sites in the wider Sinclair's Bay area were assessed at this time, and public consultation was undertaken.

In 2013, the scope of the project was reduced to focus on connecting the Shetland cable to the Caithness – Moray system. This resulted in us looking at site options in the vicinity of the Caithness – Moray cable landfall site.

A preliminary search for Switching Station sites was carried out using a combination of previous work in the area, further site visits and map-based investigation, which drew upon information obtained from the statutory authorities and other recognised sources of map data. Some of the key data that informed the search for site options are presented on the maps below.

The search identified a number of potential sites, resulting in six sites options presented at the local public exhibitions in September 2015.

Mapping development constraints as part of the preliminary search for sites

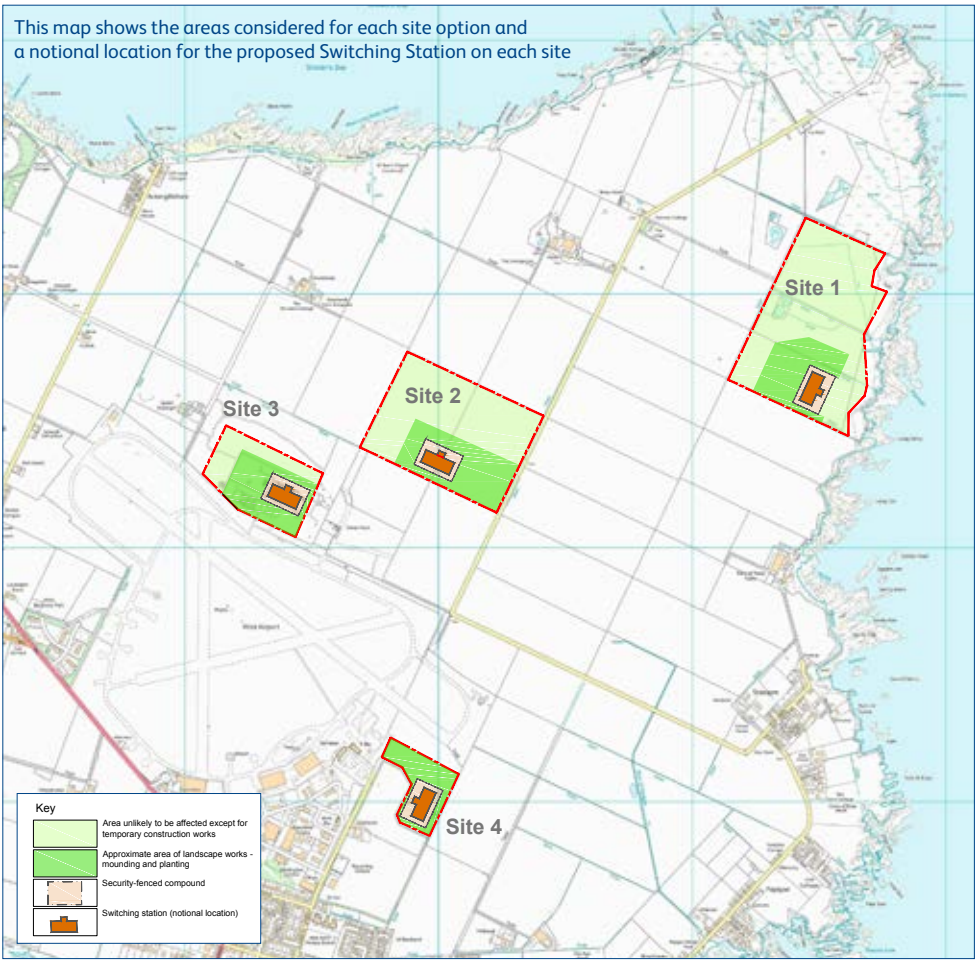
Amenity areas

Population centres and proximity to people

Flood risk

Peat depths

Site options



Short-listing of site options

Technical engineering requirements, financial considerations, environmental issues, and feedback from the public exhibitions were all considered in balance throughout the site selection process.

SHE Transmission commissioned WSP | Parsons Brinkerhoff, a multidisciplinary environmental and engineering consultancy to look at the environmental constraints associated with each site. In all cases, the same basic layout and building design was considered, and allowance was made for mounding and planting around the building to partially screen it and to provide biodiversity interest.

Site 1 (Noss Coast)

Site 1 is close to the coast. Wider visibility of a building on this site would be substantially restricted by the higher ground inland. The building would be widely visible within a kilometre or so to the north and west, and between two and three kilometres to the south and southwest. There would be some more distant limited visibility from local high points to the west and the south.

The site would be very visible from around Staxigoe Harbour and from the houses at the north side of the village.

Locally, the coast between Staxigoe and Noss Head is of high scenic value and a building that stands proud of the horizon in views from Staxigoe would be highly intrusive in the local landscape.

The site has been managed for many years in an ecologically sensitive manner and to encourage breeding birds. It is mainly semi-improved grassland, with the land nearest the cliff-tops being relatively species-rich. The site as a whole is used by breeding birds, with the northern fields being more heavily used than the southernmost
one. Otters use the coast and the cliff top fields and there are holts along the cliff-tops.

The site forms part of the setting of Noss Head lighthouse, an A-listed building, which is particularly striking in views from Staxigoe.

An informal path from Staxigoe along the cliff tops to Noss Head, runs across the site.

View from Staxigoe Harbour towards Noss Head

Species-rich grassland on the seaward part of Site 1

Key Environmental Issues

Advantages

- The site sits low and, although obvious locally, it would not be very noticeable beyond the Noss Head area
- Soils of relatively low agricultural grade

Disadvantages

- Impact on the character of Noss Head and the setting of Noss Head lighthouse, an A-listed building
- Effects on the visual amenity of Staxigoe Harbour
- Loss of some of the more valuable grassland habitats on Noss Head, an area used by protected species and by relatively uncommon birds

Site 2 (Low Field)

Site 2 is by the low point on the minor road between the airport and Noss Farm.

A development here would be visible from everywhere within about a kilometre to the north, west and southwest; as far as the coast to the east and southeast at Staxigoe and Papigoe and, more distantly, from the edge of Wick.

Further afield development would be visible from the more open areas to the west and from higher ground south of Wick, but unlikely to be prominent from these distances.

The landscape is open rolling fields of moderate scenic value. A development here would sit into the landform and normally be seen against a backdrop of higher ground or below adjacent higher ground. It would be a clearly noticeable addition to the landscape but could fit into the existing field pattern and not be particularly intrusive.

The site consists of two arable fields of improved grassland, an important part of the farm's rotation programme. Due to intensive agricultural management, the site is of relatively low ecological interest. It provides foraging habitat for wintering wildfowl but is surrounded by similar habitat so this is not a particular constraint.

The site would be visible from The Pap broch and from Noss Head Lighthouse but is unlikely to significantly affect their setting. It sits alongside the minor road to Noss Head and there would be some disturbance to local recreational use during construction.

View across the site towards Noss Farm

View across the site from the end of the track to Noss Farm

Key Environmental Issues

Advantages

- Relatively low in the landscape, the site would be prominent locally but, although visible, not overly intrusive in the landscape
- Limited effects on cultural heritage interests
- Little effect on local ecology or wildlife

Disadvantages

- Loss of an area of better quality agricultural land

Site 3 (Wick Airport North)

Site 3 is on the north edge of Wick Airport. This is almost the highest point north of Wick, so a development here would be visible from almost everywhere in the open country within 3 km in all directions, apart from most of the tip of Noss Head and the valley of the Wick River. There would be more distant visibility, mainly from higher ground, to the west and the south.

The landscape around the site consists of open rolling fields of moderate scenic interest and the flat land of the airport. The development would sit proud, normally seen above the skyline – a noticeable new feature in a location where it would be difficult to make it 'sit well' in the landscape.

The site is heavily grazed land, agriculturally of moderate quality. There is nothing of particular ecological interest on the site and whilst it does not appear to provide breeding bird habitat it may be used as foraging habitat for over wintering birds such as geese and swans.

The most important feature of the site is the WW2 bomb store. This is a currently identified as a locally important structure. However, Historic Environment Scotland (HES) have confirmed that it is of interest as a relatively rare example of this type of structure and they may in future consider it for designation as a scheduled monument.

View from just west of the corner of the Noss Head road

Oblique aerial view (the small square structures are the bomb store)

Key Environmental Issues

Advantages

- It would have little effect on the local ecology or wildlife
- It would have limited effects on agriculture
- The site is of no particular scenic interest

Disadvantages

- It would be very widely visible
- It would entail the loss of the WW2 bomb store, a site that may in future be considered for scheduling as of national historic importance

Site 4 (Wick Airport East)

Site 4 is just east of Wick Airport, next to where the Nuclear Decommissioning Agency (NDA) archive building is being built, a short distance from the airport access road.

Development on this site would be seen as an extension to the airport complex and, in most views, existing airport development would either hide the building or provide a context and backdrop. Overall development would have little influence on the wider landscape.

Visibility from the airport access road and the airport would be limited because of the trees along the roadside but it would be very visible to visitors arriving at the new NDA Archive building and from the rear of houses on the edge of Wick.

The site is partly under arable cultivation and partly semi-improved rough grassland, with some habitat suitable for reptiles. As such it is of moderate ecological interest, although given its proximity to the airport it is unlikely to be used by wintering wildfowl.

In archaeological terms, the only feature of interest is the brick building associated with the WW2 airfield but this is unlikely to be affected by development. It would have some effect on the setting of nearby listed buildings although this is unlikely to be significant in the context of the existing buildings of a similar scale at Wick Airport.

View from the Staxigoe War Memorial

Oblique aerial view

Key Environmental Issues

Advantages

- Development would be seen in context with Wick Airport and the surrounding industrial buildings
- The site is of no particular scenic value and although visible from a quite a lot of houses, it would be in views to the rear
- It would have a relatively low effect on the local ecology and wildlife
- It would have a relatively little effect on agriculture

Disadvantages

- It would be likely to dominate the setting of the new NDA Archive building – an important new feature building for Wick and Caithness
- Relatively close to the north edge of Wick

Selecting a preferred site

Basis for site selection

WSP | Parsons Brinkerhoff reviewed all the information gathered over the last five years by SHE Transmission, undertook additional environmental baseline studies and carried out fresh landscape and ecological surveys on the ground.

As part of this, the potential effects on the visual amenity of individual properties and places of public interest were considered.

Technical engineering requirements, financial considerations and environmental issues were all considered in balance to allow the sites to be ranked in order of preference, following SHE Transmission's internal guidance on substation site selection.

Additional considerations

Given the proximity of Wick Airport to the sites, SHE Transmission held discussions with the Civil Aviation Authority and Highlands and Islands Airports Limited (HIAL) during the site selection process to discuss the proposed development and the short-listed sites.

SHE Transmission were advised that since both sites 3 and 4 are within the aerodrome boundary, the switching station development would not be possible at these locations as it would impact on radar systems at the airport.

Development at sites 3 and 4 has therefore been ruled out, although information about these sites has been presented here for completeness.

The preferred site

The four short-listed sites were ranked in order of preference. Overall ranking: First – Site 2 (low field); Second – Site 3 (Wick Airport North); Third – Site 4 (Wick Airport East); Fourth – Site 1 (Noss Coast).

The switching station building will be up to 150m long and 100m wide, and will be up to 21m in height. We will dig the building into the ground and create additional landscaping to ensure that the building will extend no more than 17m above the existing ground level at the site.

Site 2 (low field) was shown to have the least environmental impact, and this, when considered alongside technical, operational and financial aspects of the development, led to it being chosen as the preferred site for the switching station development.

The design for site 2 is being developed and the plans and illustrations that follow are indicative. Your feedback will help in finalising the design.

The switching station building will be up to 150m long and 100m wide.

Landscape design

The design intention is to dig the building into the hillside and to create landscape mounds around it. This will help the building "sit" into the landscape so that its height is less apparent.

Clumps of native trees and shrubs will be planted around the building – with the intention that in the long term these provide a degree of screening and shelter not unlike the trees around Noss Farm. We will investigate the possibility of creating wildflower meadows on the grass areas within the site.

Building design

Various options are under consideration for the building design, some examples have been provided – both the form of the building and the design of the cladding.

Simple portal frame building

Curved roof building

Curved roof and architectural detailing

Plain colour

Patterned colour

Colour bands

How you can have your say

Today's event is part of the second of three stages of public consultation that we intend to carry out while we develop detailed proposals to form the basis of a planning application. Please feel free to speak to members of our project team, who are here to answer any questions you may have and to explain the information presented on the boards.

How can I give feedback on the options?
At this stage, we are particularly keen to receive feedback on the option building styles and finishes we are assessing to inform the planning application. We would also be pleased to receive any wider comments, questions or suggestions about the development process and any other steps you think SHE Transmission could take to reduce the impact of the development on the local area during construction and operation.

Please make your comments as specific as possible in order to help us consider them in relation to our proposal. The closing date for feedback as part of the site selection process is **Friday 22 April 2016**.

Feedback submitted to SHE Transmission as part of the pre-application consultation process is not part of the statutory consultation which will be carried out by the consenting authorities. Once an application for consent has been submitted, there will be an opportunity to make formal representations to the Highland Council before it takes a decision.

Comments can be submitted as follows:

1. **At the exhibition today** – complete a Comments Form and place it in the box provided.
2. **By post** – complete a Comments Form and post it to our Liaison Manager (details below).
3. **By email** – complete a Comments Form and email it to our Liaison Manager (details below).

Comments forms and all the information from today's event will also be available to download from the project website at **www.ssepd.co.uk/CaithnessHVDC**. Information can also be posted out to you by our Liaison Manager upon request.

Get in touch with our Liaison Manager

Neil Anderson
Email: neil.anderson@sse.com
Phone: 07500 912 506

Keep up-to-date at www.ssepd.co.uk/CaithnessHVDC

Write: Neil Anderson, SHE Transmission,
Inveralmond House, 200 Dunkeld Road,
Perth, PH1 3AQ

SHE Transmission

@SHETransmission

Your comments

Caithness HVDC Switching Stations Public Consultation 21 and 23 March 2016

We hope that this exhibition has helped to inform you about our proposal and the stage it has reached.
To help record your views and to improve the effectiveness of our consultation with local communities and other consultees, we would be grateful if you could take a minute to complete this short questionnaire - thank you.

Please complete in BLOCK CAPITALS

1. How did you find out about this exhibition?

☐ Local Newspaper ☐ Posters ☐ Word of mouth ☐ Website ☐ Social media ☐ Other

Please include any comments about the promotion of the event here:

2. Has this exhibition been helpful in explaining the need for the HVDC Switching Station in Caithness?

☐ Very helpful ☐ A little helpful ☐ Not helpful ☐ Not helpful at all

Please include any further comments here:

3. Do you understand the reasons for the preferred site for the HVDC Switching Station?

☐ Yes ☐ No

Please include any further comments here:

4. From the following examples, please number the building structural designs in order of preference from 1 to 3, with 1 being your preferred choice.

Simple portal frame building

Curved roof building

Curved roof and architectural detailing

5. From the following examples, please number the building finish designs in order of preference from 1 to 3, with 1 being your preferred choice.

Plain colour

Patterned colour

Colour bands

6. Are there any other steps you think SHE Transmission could take to reduce the impact of the development on the local area during construction and operation?

7. About you – please complete your details in BLOCK CAPITALS

Name _____

Address _____

_____ Postcode _____

Telephone _____

Email _____

Which Community Council area do you reside in? _____

If you would like your comments to remain anonymous, please tick this box ☐

Thank you for taking the time to complete this form. The closing date for comments on this consultation is 22 April 2016.

Please place in the comments box at the exhibition or return to:

Neil Anderson, Manager of Communities team,
Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ
Email: neil.anderson@sse.com

Any information given on this comments form may be used and published as part of SHE Transmission's consultation report. By completing this comments form you consent to SHE Transmission using this information for these purposes. By providing contact details you consent to SHE Transmission contacting you in relation to this proposal. Your details will not be used for any other purpose. If you wish your comments to remain anonymous, please tick the box at the end of this form. Please note that comments made to SHE Transmission are not representations to the Council as planning authority at this stage. The opportunity for lodging representations will be when the application is formally submitted to the Council for formal consideration.

This comments form has been developed on behalf of Scottish Hydro Electric Transmission plc (SHE Transmission) which is part of the SSE Group. Registered in Scotland No. SC213461.
Registered office: Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.